REMARKS

Status of the Application

Claims 1-10 are pending in the application. Claims 1-10 were rejected. Claim 1 is an independent claim.

Fig. 3 and graphs 1 and 2 were objected to because they did not include legends to differentiate prior art subject matter from inventive subject matter.

Claims 1-10 were rejected as: (i) anticipated by "202 Superend LOE" that was discussed in the opposition proceeding relating to the European Patent counterpart to the present application; (ii) anticipated by United States Patent Number 5,711,448 ("Clarke"); (iii) obvious based on Superend 202 LOE in view of Clark; (iv) obvious based on Clarke in view of PCT Publication WO 96/37414 ("Carnaudmetalbox"), and further in view of either Publication EP 432 569 ("Schmalbach") or Superend 202 LOE; and (v) obvious based on either Schmalbach or Superend 202 LOE in view of Clark, and further in view of Carnaudmetalbox.

Objection to Fig. 3 and Graphs 1 and 2

Applicant submits a corrected Figure 3 and graphs 1 and 2 that comply with the office action by identifying the prior art portions. For amended graphs 1 and 2, Applicant would like to direct Examiner to the enclosed appendices, Graph 1 and Graph2. Applicant respectfully submits that the objections to Fig. 3 and graphs 1 and 2 are obviated.

Claim Rejections

Claims 1-10 have been rejected as being anticipated by "202 Superend LOE" (Office Action, paragraph 3) having a diameter of 1.4724 inches, an opening area of .487 inches, and an aspect ratio of 1.49. The Office Action incorrectly refers to the 202 Superend LOE drawing or the product embodied in the drawing as "admitted prior art," but it is not prior art because of its date and because it is Applicant's own work. This discussion will use the phrase "202 Superend LOE" to refer to the cited drawing and the product it depicts.

For background, this rejection is apparently based on drawing D-202033 ("the 033 Drawing"), "printed" May 1, 1998, that is part of the E1.3 document submitted in the

opposition proceeding in the European Patent Office related to the European counterpart to the present application and disclosed to the United States Patent and Trademark Office in the March 16, 2006 Supplementary IDS as reference number 34. This 033 Drawing is the second drawing appearing in the E1.3 document.

The 202 Superend LOE is not prior art under Section 102 because it depicts Applicant's own product, and it is not prior art under Section 103 because it was neither described in a non-confidential publication, in public use, nor on sale more than one year before the effective filing date of the present application.

As an initial matter, the 033 Drawing's "printed" date of May 1, 1998, is less than one year prior to the date of the priority document, to which the present application claims priority. For this reason alone, the 202 Superend LOE reference is not prior art under Section 102(b).

Further, the 033 Drawing reflected the inventor's (that is, Mr. Field's) own work. The Examiner has the documents from the opposition proceeding that describe the development of the 202 Superend LOE, which speak for themselves, but Applicant points particularly to an email dated March 27, 1998, from the inventor, Mr. Brian Fields, providing directions to manufacture an end according to specific specifications. In the email, Mr. Fields provided an example with the following criteria: an aspect ratio of 1.47 and an area of approx. 0.48 square inches. (March 16, 2006 IDS Reference 29, Annex CC&S 4). In apparent response to Mr. Fields' e-mail, Stolle Machinery provided the 033 Drawing depicting a can end with dimensions in accordance with Mr. Fields' instructions: a score opening of 0.487 square inches, a centre panel of diameter 1.4724 inches, and an aspect ratio of 1.49. (March 16, 2006 IDS Reference 34, E1.3).

Not only did the 033 Drawing reflect direct instructions from Mr. Fields to Stolle Machinery on the most important claim limitations, but Stolle Machinery was obligated to keep the project confidential. For example, in the correspondence dated October 29, 1996, Applicant explicitly stated, "as a result of your confirmation of the secrecy agreement for our Superend project I am writing to you to set out our development objectives for this project." (March 16, 2006 IDS Reference 28, Annex CC&S 1). Furthermore, the drawings identified as 3-3009748-B and 3-3009759-A that Applicant sent to Stolle Machinery were marked as follows:

The drawing is the property of Crown Cork & Seal Company, Inc. . . . Information contained hereon is confidential and may not be reproduced or copied in whole or part or disclosed to others.
(March 16, 2006 IDS Reference 29, Annex CC&S 2).

The above facts make it clear that the 033 Drawing cited in the office action as 202 Superend LOE is not prior art under Section 102(a) at least because it was Applicant's own work, and it is not prior art under Section 102(b) at least because it is not early enough in time and it was shared under an obligation of secrecy. Accordingly, all the rejections based on the cited 202 Superend LOE should be withdrawn.

The office action in paragraph 4 rejects claims 1 – 10 based on other purportedly "admitted prior art" from the opposition proceeding (having attributes of 1.835 inch diameter, 0.593 square inches, and an aspect ratio of 1.49) in view of Clarke. The attributes asserted as admitted in the office are close to those admitted as prior art on page 8, line 3 et seq. of the pending application and identified in application Figure 3 as plot A. Without admitting whether the information in this paragraph from the opposition proceeding is prior art, Applicant requests withdrawal of this rejection because Clark expressly teaches the opposite of what it is cited for.

Clarke states it is an object "to facilitate the use of *larger size* openings" and that a "'larger opening' is . . . in the range of approximately 0.5 to 0.75 square inch." (Clarke col. 2, lines 33-35 & 9-14) (italics added). Clarke's express teaching relating to facilitate the "larger opening," *inter alia*, explicitly teaches away from reducing the 0.596 inch opening of the prior art to the claimed area of less than 0.5 square inches (as recited in Applicant's claim 1). The office action cites to Clarke's statement regarding ends having a smaller opening at column 2, lines 15-16, but Clarke at that point is referring to standard ends – that is, Clarke is discussing structure that its teaching leads away from.

Moreover, neither Clarke nor the other cited references appear to appreciate the "improved flow characteristics," as recited in Applicant's preamble. Other than stating that openings larger than 0.5 in^2 "are formed within can ends for either aesthetic reasons or to ensure greater pourability and drinkability" (Clarke, col. 2, lines 6-9), Clarke is silent on pouring characteristics of openings. Clarke, in fact, is directed not to flow characteristics of

the opening at all, but rather is directed to the mechanical aspects of opening the tear panel of a larger diameter end.

In this regard, after explaining that the problems of non-turnunder and insufficient opening "are exacerbated as larger openings are formed with can ends" (Clarke, col. 2, lines 1-7), Clarke lists three objects of the invention – the first two of which are related only to shearing of the tear panel.[1] The third object expressly states that Clarke's object relates to the mechanical problems associated with larger openings (that is, openings larger than those claimed by Applicant):

> A further object is to *facilitate the use of larger size openings* in beverage container ends without encountering the problems of non-turnunders and insufficient angles.
>
> (Clarke, col. 2, lines 33-35; italics added).

Clarke, considered as a whole and based on its express object "to facilitate the use of a larger size opening" (that is, one having an area of at least 0.5 in^2), would lead an end manufacturer or designer toward employing a larger opening.

Thus, considering Clarke's silence on the flow characteristics of its opening and the explicit statement that its object relates to mechanical opening properties of the tear panel for ends larger than 0.5 in^2 opening area, a person considering designing smaller ends and optimizing flow characteristics of smaller ends having an opening area less than 0. 5 in^2 would not look to Clarke. Notwithstanding general statements relating to its opening's suitability to other sizes, and considering the reference as a whole, Clarke, in fact, teaches away from reducing the opening size below 0.5 in^2.

Moreover, as explained in the Declaration of Mr. Brian Fields (already of record in Applicant's response of December 9, 2002), prior to the Applicant's discovery and invention, the conventional thinking at the time the invention was made led away from employing the claimed aspect ratio range and toward a substantially circular geometric shape. As explained in Paragraph 5 of Mr. Field's Declaration, a geometric shape approaching a circle was considered to provide the best combination of open area and good flow parameters. Further,

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[1] "Non-turnunder" means that the rupture of the score line fails to propagate fully around the tear panel and instead gets only to a point, usually at about the 3:00 position, where the tab starts slipping and bends the metal of the partially opened tear panel metal down so that the tab then slips off the tear panel and becomes useless. (Clarke III, col. 1, lines 52-60).

a slot-shape was generally considered to be not preferred because of the inherent difficulties in drinking from a slot-shape opening – including the fact that the pursed lips of some drinkers may not be wide enough to fully cover the slot, which could result in dribbling. Thus, the conventional thinking led away from an aspect ratio greater than about 1.1

The Office Action cites Schmalbach for purportedly disclosing the claimed aspect ratio. However, rather than disclosing an aspect ratio in the claimed range, Schmalbach's Abstract is silent regarding the aspect ratio. Further, a published English translation of the claims of Schmalbach, previously submitted by Applicant in its response dated December 2, 2002, likewise is silent regarding the aspect ratio.

Based on Schmalbach's silence regarding the aspect ratio, the Office Action apparently, but inappropriately, relies on measurements or proportions from the figures of Schmalbach to determine the aspect ratio. But M.P.E.P. § 2125 expressly states that proportions of features in a drawing are not evidence of actual proportions when the drawings are not to scale. As there is nothing in Schmalbach that indicates that its figures are drawn to scale, Schmalbach must be considered to teach or suggest nothing relating to the proportions of its figures, and therefore nothing relating to the aspect ratio of its opening. Accordingly, it is not appropriate to use Schmalbach for disclosure of Applicant's claimed aspect ratio, nor as either a primary reference or secondary reference on which to base a rejection.

Considering that Clarke provides no teaching relating to pour characteristics and generally guides toward employing an opening larger than 0.5 in^2, that Schmalbach provides no evidence relating to an aspect ratio, and that the conventional thinking at the time of Applicant's invention taught away from employing the claimed aspect ratio, Applicant submits that the art taken as a whole teaches away the claimed combination and that there is no incentive to combine the references. For at least the above reasons, the pending claims are allowable.

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there is no incentive to combine the references. For at least the above reasons, the pending claims are allowable.

Improved Flow Characteristics

Not only is the structure recited in Applicant's claims not taught or suggested in the prior art, but the structure provides unexpectedly beneficial flow characteristics. As explained in the second Declaration of Mr. Brian Fields submitted in this case on May 18, 2004, "flow characteristics upon initially rotating a container (as described on page 2, line 22, et seq., of the as-filed application) are important parameters in evaluating end performance. I believe the first peak of a graph of flow rate versus unit time is an important parameter that reflects inrush characteristics." (Fields Declaration, May 18, 2004, para. 6).

The data presented in charts 1 and 2 is normalized flow rate versus time; the flow rate data is normalized by the opening area and its plots have the same shape as flow rate per unit area versus time. Applicant's response of May 18, 2004, explains that the normalized flow rate data was obtained from the flow rate data by using information already of record[2]:

> "the y-axis magnitudes of each plot of . . . are multiplied by the ratio of the opening area of the base end (that is, 0.450 sq. in.) to the opening area of the particular plot's end to produce the scale on the left side of the graph. For example, each of the y-axis magnitudes (using the scale on the left side of the graph) for the end of Plot D having an opening area of 0.487 sq. in. is multiplied 0.924 (that is, 0.450/0.487). . . . The result is a plot of normalized flow rate on the y-axis versus unit time on the x-axis. Ignoring dimensions, the shape of the plots generally represents flow rate per unit area versus unit time.

Response, May 18, 2004 (citations omitted)

As explained in the Declaration of Mr. Brian Fields, a large-magnitude peak of normalized flow rate (or flow rate per unit area) generally corresponds to a beneficial inrush characteristic (Fields Declaration, para. 6). And the high initial peak values of the inventive,

[2] Applicant's as-filed application included data of flow rate versus unit time for three ends (identified as ends A, B, and C). Applicant submitted flow rate data for a fourth end (identified as end D) in the response of December 9, 2002. Applicant presented data of flow rate that was *normalized by the opening area* versus time by manipulating the existing data (that is, data for ends A – D) in the response of May 18, 2004. At the Examiner's request, Applicant submitted the data for end E on September 19, 2005.

claimed ends C, D, and E (compared to conventional ends A and B) demonstrate that Applicant's solution achieves the result of enhancing flow characteristics through a relatively small opening. (Fields Declaration, para. 7).

Applicant believes that the Examiner at one time concurred in the unexpected nature of the results because of the reference to optimization in the record of the Examiner's Interview. (Interview dated February 23, 2005). The unexpected nature of the improved flow efficiency -- characterized by the initial flow rate peaks (that is, improved inrush characteristic) -- of Applicant's claimed end is evident from the examiner's own statements. Because the graph is evidence of unexpected results, the pending claims are allowable regardless whether the flow characteristics are recited in the claims.

Applicant also points to claims 7 through 10, which further distinguish the claimed invention over the cited art. For example, clam 7 recites that the "end exhibits a higher first peak of flow rate per unit opening area compared with the first peak of flow rate per unit opening area of an end having an aspect ratio of 1.47 and an opening area of 0.596 square inches and compared with the first peak of flow rate per unit opening area of an end having an aspect ratio of 1.1 and an opening area of 0.450 square inches."

The office action at paragraph 8 states that the full range of the limitations are not supported by the data and that the results do not show improvements or unexpected results. Applicant points the Examiner to Applicant's Reply of September 19, 2005, which summarized the Examiner's recognition of the optimization shown by Applicant's data:

> This is responsive to the last office action and the Examiner interview of February 23, 2005. In the interview, Examiner Mai recognized "the optimization in view of the graphs [submitted on 05/18/04], . . . [and] the optimization of the 'inrush flow rate' shown in the new graphs" submitted on May 18, 2004. (Interview Summary, Feb. 23, 2005). But Examiner Mai "noted that the claimed aspect ration (1.5 – 1.7) is beyond the tested range (C – 1.61; D – 1.51) [and requested] Applicant to provide new data of aspect ratio to clarify the optimization."

In response to the Examiner's suggestion, Applicant submitted new normalized flow rate data for an end E — which has an opening area of 0.450 square inches and *an aspect ratio of 1.7* — on top of the existing plots for ends A – D. The plot for end E was prepared

by the inventor Mr. Brian Fields using the same procedures that he used to prepare the plots for ends A – D. (Fields Declaration, para. 4) A summary of relevant attributes of the tested ends in the attached graph is provided below:

Label for **Prior Art Ends**	Color	Area (sq. in.)	Aspect Ratio
A – 202 LOE Normalized	pink (thick)	0.596*	1.47
B – Std 202 .450	black	0.487	1.1*

*indicates a parameter that is outside the range of the present claims.

Label for **Inventive Ends**	Color	Area (sq. in.)	Aspect Ratio
C – 202 SE LOE .450 1.6	red	0.450	1.61
D – 202 SE LOE .487 Normalized	blue	0.487	1.51
E – 202 SE LOE .450 1.7	pink (thin)	0.450	1.7

The graphs shows that the magnitude of the first peak of normalized flow rate (or flow rate per unit area) of the opening of end E is significantly higher than the first peaks for the conventional ends A and B. In fact, the magnitude of the first peak and the general shape of the plot of normalized flow rate for end E are clearly like those of other inventive ends C and D, and are clearly different from those of conventional ends A and B. And the data shows that all three plots of normalized flow rate have generally higher peaks than all those of the prior art.

Support for the Claimed Range

The attached charts of normalized flow rate of inventive ends C, D, and E show aspect ratios of 1.51, 1.61, and 1.7 and opening areas of 0.445 and 0.487. Accordingly, the statement in the office action regarding only a single data point is incorrect. If the Examiner determines that this data is still insufficient to support the entire claimed range, Applicant requests and opportunity to discuss the support and, if necessary, provide additional data.

CONCLUSION

For all the foregoing reasons, the Applicant submits that the application is in condition for allowance. Accordingly, a Notice of Allowance for claims 1-10 is respectfully requested. If, for any reason, the Examiner does not agree that the application is in condition for allowance, the Examiner is encouraged to contact the undersigned by telephone in order to resolve any remaining issues.

Enclosures: Appendices Graph 1 and Graph 2.

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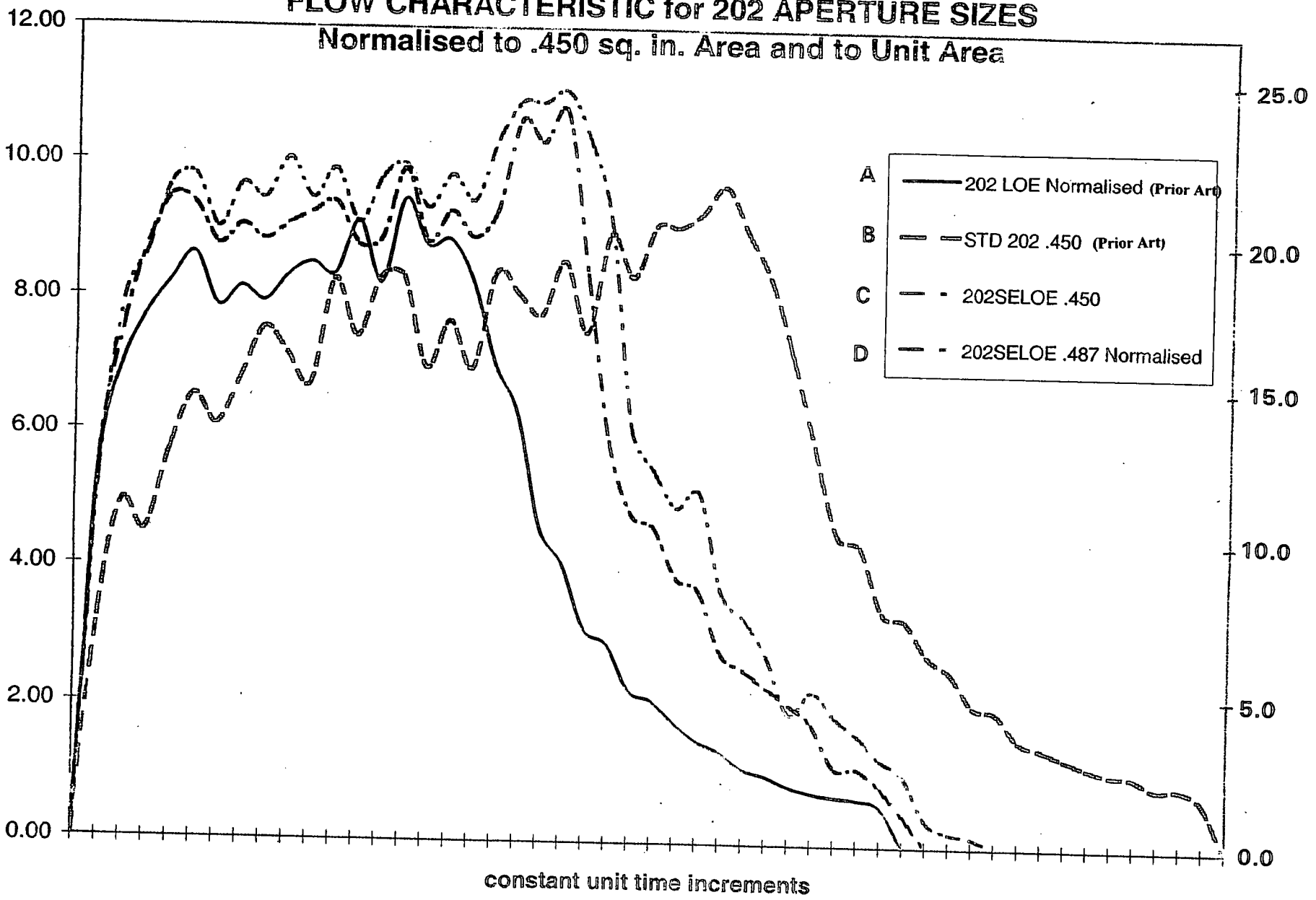
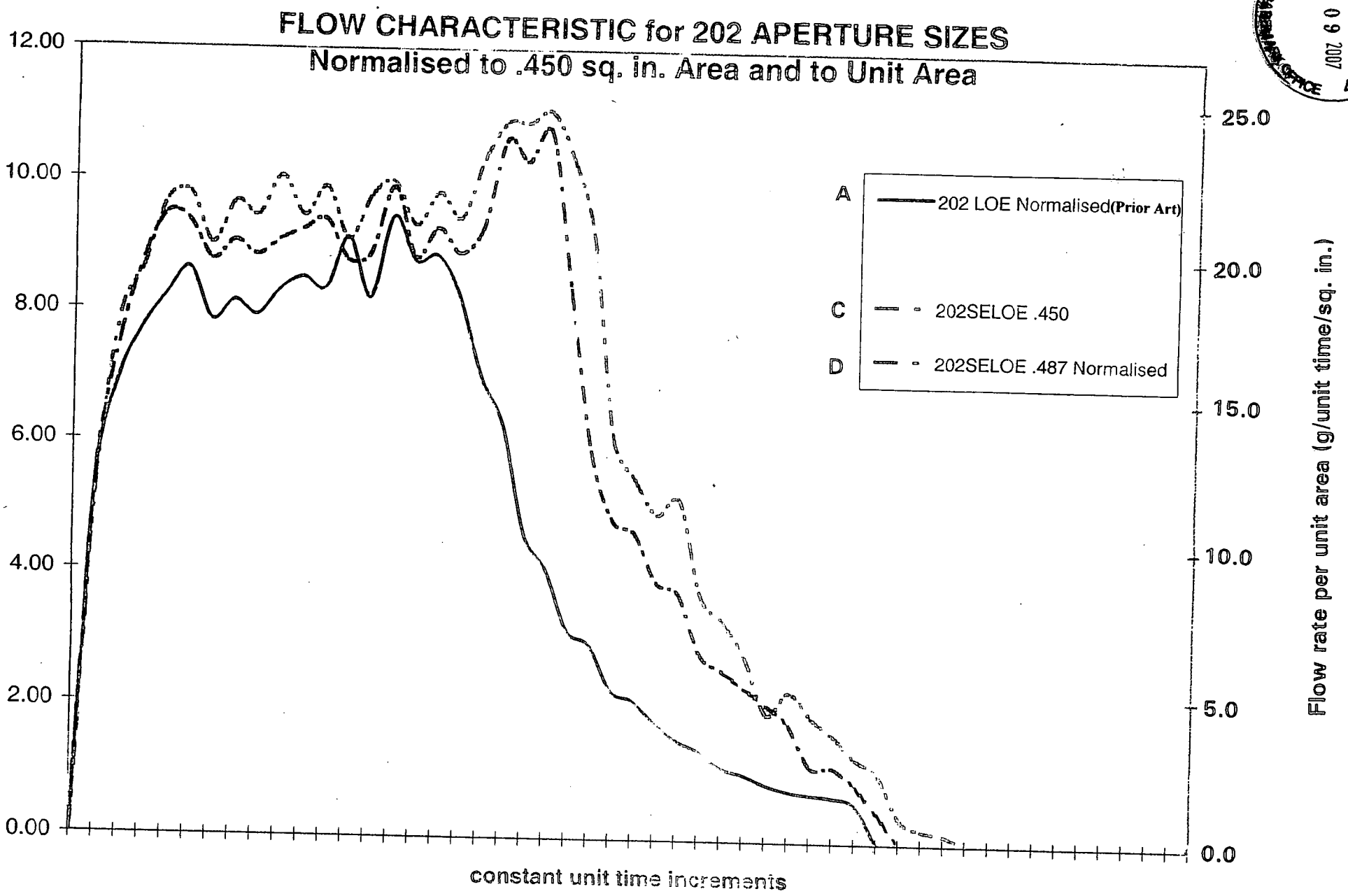


Graph 1



Graph 2